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Simulations of an electro-optical in-vacuum bunch profile monitor and measurements at KARA for use in the FCC-ee

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The Karlsruhe Research Accelerator (KARA) is an electron storage ring and synchrotron light source for accelerator research at the Karlsruhe Institute of Technology (KIT). It features an electro-optical (EO) in-vacuum bunch profile monitor to measure the longitudinal bunch profile in single shot on a turn-by-turn basis using electro-optical spectral decoding (EOSD). A simulation procedure has been set up to evaluate its suitability as a beam instrumentation for the operation of the future electron-position collider FCC-ee. In order to assess the simulations, this contribution focuses on a comparison to EO sampling (EOS) measurements at KARA and a study on the heat load of the EO crystal due to the expected high bunch repetition rate envisioned for FCC-ee.

Footnotes

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Primary author: REISSIG, Micha (Karlsruhe Institute of Technology)

Co-authors: MOCHIHASHI, Akira (Karlsruhe Institute of Technology); MUELLER, Anke-Susanne (Karlsruhe Institute of Technology); HAERER, Bastian (Karlsruhe Institute of Technology); BRUENDERMANN, Erik (Karlsruhe Institute of Technology); NIEHUES, Gudrun (Karlsruhe Institute of Technology); STEINMANN, Johannes (Karlsruhe Institute of Technology); PATIL, Meghana (Karlsruhe Institute of Technology); RUPRECHT, Robert (Karlsruhe Institute of Technology); FUNKNER, Stefan (Karlsruhe Institute of Technology)

Presenter: REISSIG, Micha (Karlsruhe Institute of Technology)

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